Case Report

Perioperative challenges in management of a deaf and dumb patient posted for high-risk cardiac surgery

Vivek Chowdhry, Manoranjan Padhi, B. B. Mohanty[1], Suvakanta Biswal[1]

Departments of Cardiac Anesthesiology and [1]Cardiovascular and Thoracic Surgery, CARE Hospital, Bhubaneswar, Odisha, India

ABSTRACT

Perioperative management of deaf and dumb patients can be a challenging task. For smooth postoperative recovery, proper care should begin in the preoperative period. Understanding the patients' needs and training him to follow the instructions requires to involve a communication specialist. Judicious use of sedatives and analgesics is essential to keep the patient pain-free and comfortable. Postoperatively, the patient should be kept awake, enough to understand the internal need of the body and to make a meaningful response to external stimuli. Adequate preoperative planning and coordinated team efforts with involvement of specialists can help in delivering better postoperative care.

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INTRODUCTION

Congenitally, deaf and dumb patients posted for high-risk surgeries are cases which require special attention and care. Preoperative assessment of the patient's expressing capabilities, educational background, and basic understanding ability can help in deciding the required level of preoperative training. Appointment of a sign language or communication specialist can help in establishing an effective communication between the patient and the healthcare provider. Judicious use of sedatives and analgesics in the postoperative period, early mobilization and allowing a family member to visit and communicate with the patient can expedite the recovery process. Despite being one of the most common disabilities worldwide, there is hardly any article published about difficulties and perioperative management strategies of deaf and dumb patients. The author feels it is the first case report of management of a deaf and dumb patient undergoing cardiac surgery.

CASE REPORT

A 45-year-old, deaf and dumb male patient of low socioeconomic strata was admitted with a history of easy fatigability and breathlessness on less than ordinary activities (New York Heart Association functional class-III/IV). He was a known case of chronic rheumatic heart disease; on further workup, he was found to have severe mitral stenosis with an area of

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Address for correspondence: Dr. Vivek Chowdhry, Department of Cardiac Anaesthesiology, CARE Hospital, Near Municipal Kalyan Mandap, Chandrasekharpur, Bhubaneswar - 751 016, Odisha, India.
E-mail: vivek.chowdhry@gmail.com

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0.9 cm^2, enlarged left atrium with clot in the left atrial appendage and moderate aortic regurgitation in atrial fibrillation. The patient was taken up for preoperative optimization with digoxin, diuretics and heparin and later posted for double valve replacement. On further enquiring, it was found that the patient was deaf and dumb since birth and was working as a motor mechanic. The parents of the patient were healthy with no hearing or speech defect and had five children, three sons and two daughters. Among them, two sons and one daughter were deaf and dumb congenitally while the rest had normal hearing and speech functions. The patients' wife and son had normal hearing and speech functions. The preoperative visit focused on educating and interacting with the patient and his wife. Due to the poor educational background of patient's wife and other relatives, a sign language specialist was appointed to communicate as well as train the patient. The patient was explained about the surgical procedure and anticipated postoperative course, and taught to express pain by showing the visual analog scale (VAS).

The formal preanesthetic check-up revealed no significant co-morbidities. On the day of surgery, the patient was briefed about the procedure and the postoperative course in the presence of his wife and family members. In the operating room, a 16 gauge intravenous cannula and femoral arterial catheter were secured under local anesthesia. Central venous catheter was inserted after induction of general anesthesia. The patient was monitored according to the American Society of Anaesthesiologist standards. The patient was induced with midazolam and fentanyl; trachea was intubated with an 8 mm cuffed endotracheal tube after administration of vecuronium bromide and was put on mechanical ventilation with a mixture of 50% oxygen in air. Anesthesia was maintained with isoflurane and intermittent boluses of fentanyl and vecuronium bromide. Heparin was administered, aorto-bicaval cannulation was done and after achieving an activated clotting time (ACT) over 480 s cardiopulmonary bypass (CPB) was instituted. On CPB, a pulsatile flow was maintained, and the mean blood pressure was maintained between 65 and 75 mm of Hg. Mitral valve was replaced through left atrial approach with a 29 mm mechanical valve (St. Jude Medical Inc. Minnesota, USA) and aortic valve was replaced with 21 mm mechanical valve (TTK Chitra, Chennai, India). The patient was weaned of CPB without any difficulty. Meticulous hemostasis was done, and heparin was neutralized with protamine to normalize ACT. Two units of platelet concentrate were transfused after coming off CPB as per institutional protocol. Two chest tubes were placed, one in the mediastinum and the other in the pericardium. The chest was closed, and the patient was transferred to the intensive care unit and put on ventilator with stable hemodynamics. The immediate postoperative course was uneventful; the patient was extubated after 6 h. Postoperative analgesia was maintained with continuous infusion of fentanyl at 20 μg/h for first 24 h along with intravenous tramadol hydrochloride 75 mg tds. After extubation, the intensity of pain was assessed by VAS. After 24 h, pain was managed by intravenous tramadol and paracetamol to keep the VAS under 5. Gradually, the catheters and drain tubes were removed. Oral medications and feeding were started, the patient was mobilized and shifted to ward. The family members were allowed to visit frequently and interact with the patient. The patient was discharged on the 6th postoperative day with proper follow-up advice.

DISCUSSION

According to WHO, an estimated 278 million people have disabling hearing impairment.[1] According to census of India 2011 data on disability, about 5 million people suffer from significant auditory loss. Hearing loss has found to be the second most common cause of disability.

Congenital hearing loss is present at birth. It can be hereditary or due to abnormalities present in utero or due to injuries at the time of birth. More than 50% cases of congenital hearing loss are due to genetic factors, mostly due to autosomal recessive inheritance but can be autosomal dominant or X-linked.[2] About 80% of congenital deafness do not have any distinguishing features and are nonsyndromic, while 20% are associated with various syndromes like Alports, Crouzon, Usher, Down, Treacher Collins, Jervell and Lange-Nielsen, Pendered, Stickler syndrome, etc.[3] Three grades of deafness have been documented in literature; persons with sudden onset deafness, persons who lost their hearing after development of speech, and persons who are born deaf. The persons in later group also suffer from prelingual deafness.[4]

It has been recognized that the deaf population is at risk of receiving inadequate health care and health-related information because of limitations of communication between the deaf person and the health care workers. Knowledge of cardiovascular disease among deaf people is low as compared to the normal hearing population.[5] Not much of the healthcare workers are experienced

enough in managing physically challenged patients. Further due to association of congenital deafness with various syndromes and other abnormalities, the perioperative management of congenitally deaf and dumb patients posted for high-risk surgery is very challenging.

Due to poor educational background and suboptimal understanding of patient's wife and other relatives, the authors find it difficult to communicate with the patient; hence, a sign language specialist was appointed to interact with the patient. The language specialist explained about the deep breathing exercises and lung expansion manoeuvre by incentive spirometry as well as trained the patient to express pain by explaining VAS.

Poor assessment and management of postoperative pain can have profound effects on the patients leading to anxiety, sleep disturbances, irritability, aggression, and unwanted stress and suffering.[6] Postoperative pain can also have physiological effects such as increases in heart rate and blood pressure, delayed gastric emptying leading to nausea, vomiting, and paralytic illeus. Failure to cough and deep breath can result in the development of chest infections. All these together can lead to delayed mobilization, prolonged hospitalization, and financial implications.[6] Therefore, accurate assessment of postoperative pain is essential to ensure that pain is managed effectively. Subjective assessment of pain could be difficult in this subset of patients. Research and advances in finding biomarkers for objective assessment of pain is underway. Typical markers that have been identified include salivary amylase, cortisol, and substance P. Pain responses have been specifically associated with secretion of calcitonin gene-related peptide (CGRP), substance P, neurokinin A, and neurokinin P.[7]

As postoperative delirium after cardiac surgery is not uncommon,[8] the authors feels, managing delirium or psychosis in these patient could be very difficult; hence, all the measures were taken to avoid delirium or psychosis.[9] Postoperatively, sedatives and analgesics were used judiciously to keep the patient comfortable and conscious enough to understand and communicate the problems.

Cochlear implants are an acceptable therapeutic option for patients with irreversible hearing loss and deaf-mutism. Cochlear implants are extremely expensive computerized electronic devices that restore partial hearing to the properly selected patients. It is surgically implanted in the inner ear and activated by a device worn behind the ear. A cochlear implant converts sound energy into electrical impulses. These electrical impulses directly stimulate the auditory nerve which carries the auditory signal to the brain. This signal transmitting pathway bypasses the damaged parts of the auditory system, allowing individuals to receive sound. At present, cochlear implant is the only accepted and established a method of therapy for deafness in children and adults. However, detection of hearing loss and implantation of cochlear device at an early age may show rapid acquisition of listening skills.

Finally, we should remember that without the help of trained healthcare workers the goal of excellence is difficult to achieve. Being considered as perioperative physicians,[10] the anesthesiologists can influence the perioperative outcome through preoperative optimization, actively taking part in training of the patients, appropriately choosing the anesthetic technique, timely initiation of preventive measures to reduce the postoperative adverse events and instituting perioperative rehabilitation programs. The nurses should be morally, ethically, and professionally engaged in the care of patients, particularly those who are vulnerable and unable to speak for themselves. Unlike other patients, these special groups of patients require continuous assessment and appropriate treatment to ensure the best possible care and pain relief.[11]

CONCLUSION

The perioperative management of congenitally deaf and dumb patients posted for high-risk surgery is difficult. The successful outcome depends on upon proper planning and a coordinated team efforts. As not much knowledge is being shared in the literature regarding perioperative management of deaf and dumb patients, authors think the under mentioned recommendations can help in optimizing the management.

- A thorough preoperative assessment of the patient including their understanding and communication skill should be gauged
- As the patient is unable to convey the problems; hence, clinical, and objective assessment should be given prime importance
- A sign language specialist who can train and communicate with the patient should be involved
- Once patient is stable, family members should be allowed to spend more time with the patient

- Minimizing sedatives and hypnotic administrations in the postoperative period to actively involve patients in rehabilitation program
- Early extubation, early removal of catheters and tubings, and early mobilization should be encouraged to prevent postoperative psychosis
- Objective assessment of pain and effective pain control protocol should be instituted
- Properly trained nurses and paramedical staff should be engaged in the care of these patients.

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Conflicts of interest

There are no conflicts of interest.

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